En Route Nutrition for Severely Injured: Battlefield to CONUS

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Contributions

- COL Steve Flaherty
- Mrs Kathleen Martin
- LRMC Trauma Program
- LRMC Research Group

Overview at LRMC and CCATT

- Early stages of conflict
- Development of feeding protocol
- Initiation of enteral feeds
- Immune enhancing formula
- Aeromedical Evacuation changes
- Monitoring of process
- Addition of early supplemental Glutamine

Early Stages of Conflict

"As you know, you have to go to war with the Army you have, not the Army you want"

Donald Rumsfeld
US Secretary of Defense
9 December 2004

LRMC Feeding Protocol

- Placement of feeding tube within 24 hours of admission
- NJ or OJ rather than PEG or surgical tube
  - GI with endoscopy
  - Surgery with open abdomens
- OG vs NG to suction
- Immune enhancing formula in all intubated
- Nutrition service input

In addition to enteral feeds: antioxidants and free radical scavengers

- Vitamin C 500 mg via OG twice a day for 7 days
- Vitamin A 5,000 IU via OG once a day for 7 days
- Vitamin E 1,000 IU via OG once a day for 7 days
- Zinc sulfate 220 mg via OG once a day for 7 days

- Nutrition labs
  - C Reactive Protein and Pre-albumin on admission

Immune enhancing formula

IMPACT with Glutamine

- **kcal/mL:** 1.3
- **Caloric Distribution (% of kcal)**
  - **Protein:** 24% **Carbohydrate:** 46% **Fat:** 30%
- **Protein Source:** wheat protein hydrolysate, free amino acids, sodium caseinate (milk)
- **NPC:N Ratio:** 62:1 **n6:n3 Ratio:** 1.4:1
- **Osmolality (mOsm/kg water):** 630
- **Supplemental Glutamine:** 15 g/L
- **Supplemental L-Arginine:** 16.3 g/L
- **Dietary Nucleotides:** 1.6 g/L
- **Fiber Content (Source):** 10 g/L

Aeromedical Evacuation changes

- Enteral feeding not approved by AMC

- JTTS monthly system VTC to bring about change

- All parties involved (CCATT, AE, AMC SG)

Aeromedical Evacuation Policy

- KUB confirmed jejunal feeding tube
- OG/NG for gastric decompression
- Separate feeding tube system but utilizing same IV pump
- Head of bed elevated with backrest
- Head towards the front of aircraft
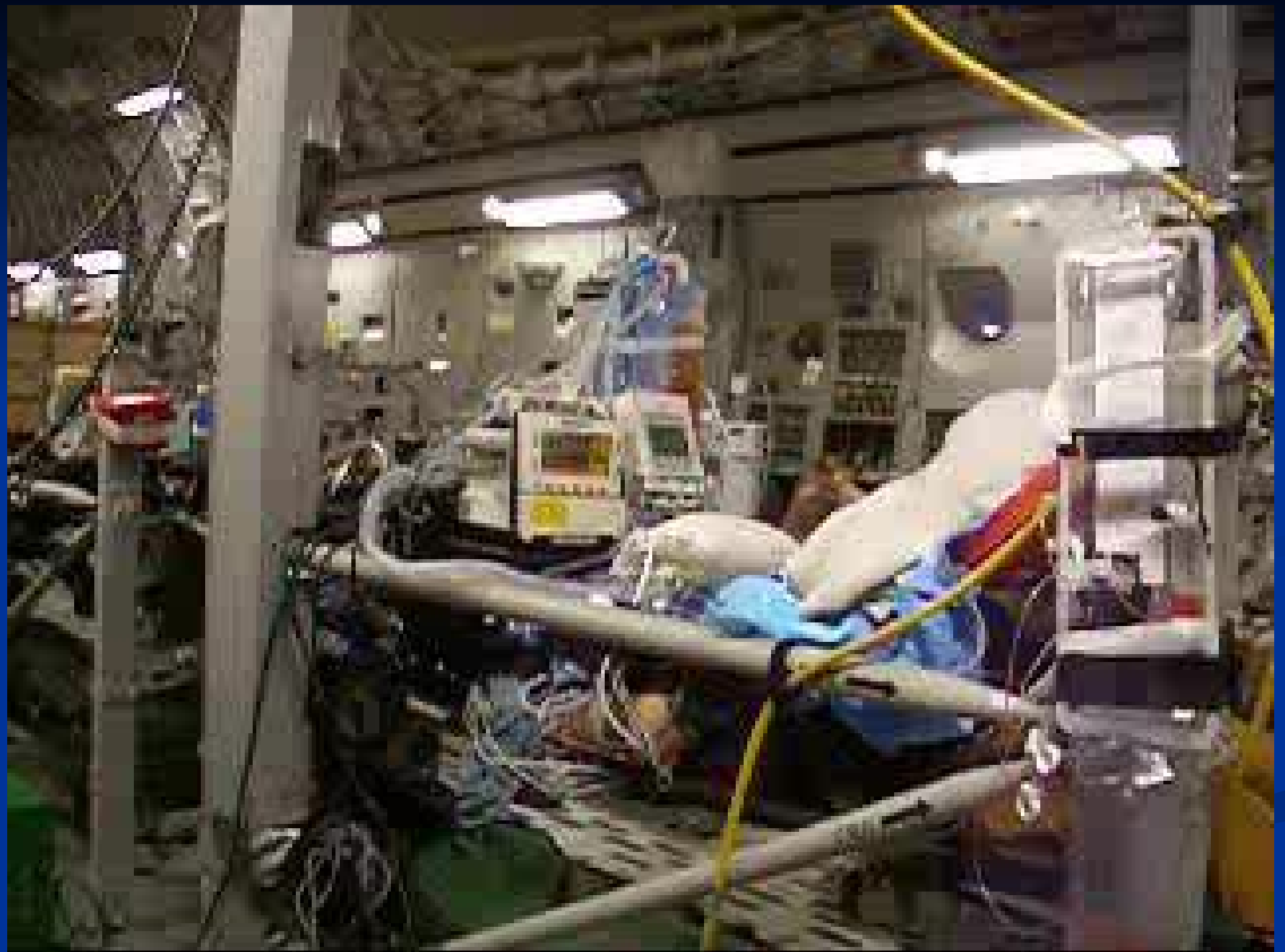- Flush tube q 8 hours

Aeromedical Evacuation Policy

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR MOBILITY COMMAND

2 1 DEC 2005

MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ AMC/SG
203 West Losey Street, Suite 1600
Scott AFB IL 62225-5219

SUBJECT: Policy Letter for Initiation of Enteral Feedings During Aeromedical Evacuation (AE) Transport from EUCOM to CONUS (05-070)

Monitoring of process

- Weekly JTTS clinical VTC
- Trauma center Process Improvement program
- CCATT PI program (Jan 08)

Addition of early supplemental   Glutamine April 07

- Glutasolve supplements (enteral glutamine   0.5 g/kg/d)
  - <80 Kg patient -- give 1 packet twice daily
  - >80 Kg patient -- give I packet three times daily
- New intolerance guidelines

Concerns with en route nutrition

- Tube placement difficulty
- How much: Metabolic cart?
- Ideal tube formula?
- Tube adaptor availability
- Diarrhea en flight
- Flow problems with feeds from bottle
- CCATT members reluctance to feed
- TRACES2 2006 documentation POOR
- OCONUS need for immediate washout/OR
- Outcomes data to support/refute what we are doing

2006 LRMC to CONUS

- TRACES2/JTTR/LRMC Trauma database/Chart review of all USAF CCATT out
- Unable to confirm if protocol followed 100%

LRMC to CONUS
01/01/06 to 03/13/07 (14 months)

486 CCATT patients
- 210 Non intubated
  - 133 reviewed records (90 Trauma Dx)
    - all with enteral access or oral feeds

- 276 intubated (237 Trauma; 05 ISS Avg 21.5/STDV 12.8)
  - 207 reviewed records (177 Trauma Dx)
    - 199 with enteral access and nutrition
    - 127 records complete for tube placement times

LRMC Trauma Patients
CCATT to CONUS

Timing of tube placement in 127 patients

Percentage

Hours from LRMC Admission
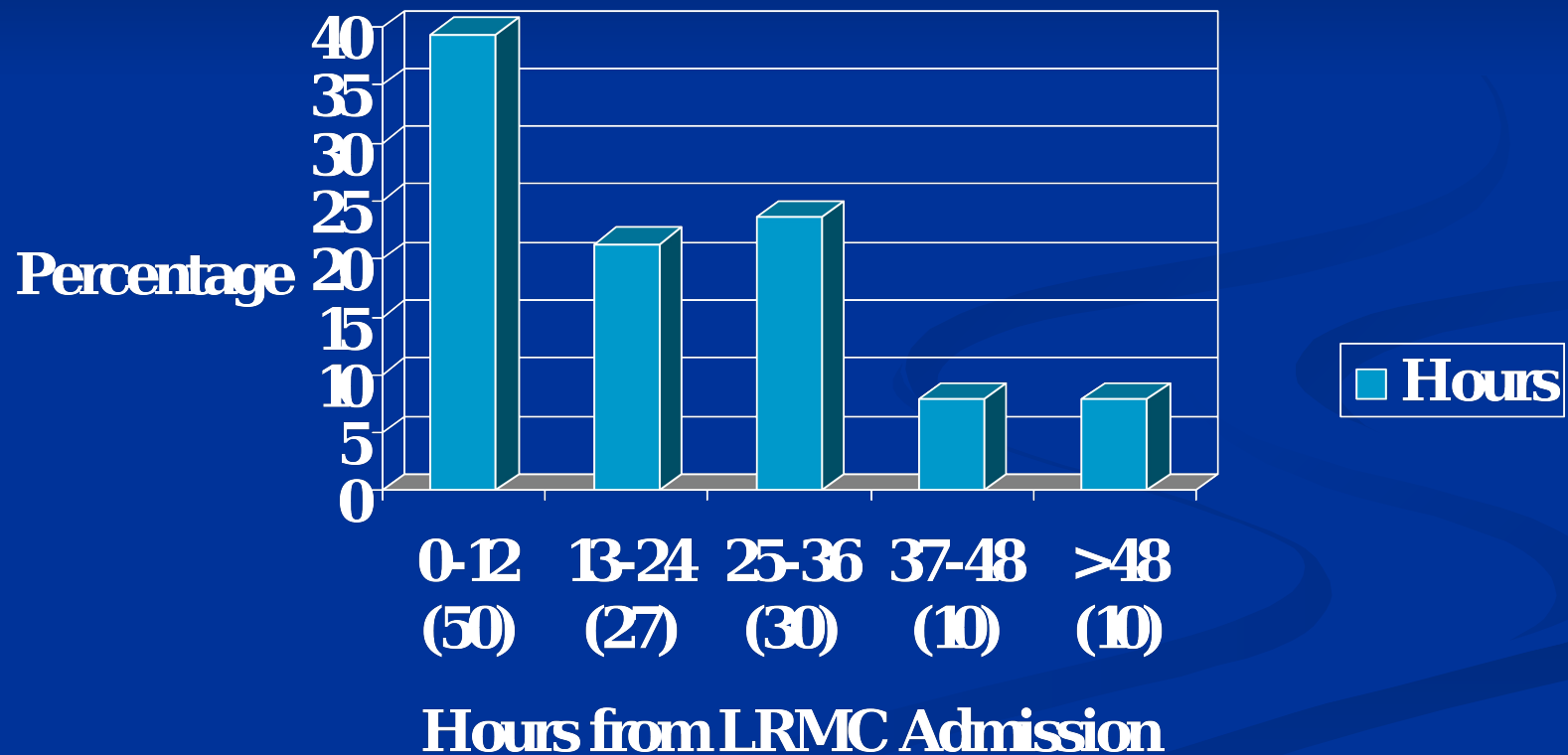
61% Had access within 24 Hrs/ Avg time 23 Hrs

Summary

- Comprehensive enteral feeding program is difficult to maintain
- En flight nutrition is safe with protocol
- Literature based
- More to improve